

# The Development of An Interactive E-Module with The Self-Reinforcing Character for Elementary School Students

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## ABSTRACT

The development of an interactive e-module with the self-reinforcing character for elementary school students aims to produce a valid, practical, and attractive product. This research and development use the R & D model by Borg and Gall. Data collection techniques using interviews, questionnaires, and observation. Whereas data analysis techniques using qualitative and quantitative techniques. Based on the material expert validation, obtained a percentage of 84% with a valid category. The teaching material expert rated product validity at 87% and the user rated the product validity at 99.3% with a very valid category. While in terms of practicality, the user gives 100% with a very practical category. From the results of the student's questionnaire in product and usage trial showed the aspect of practicality is 97% and the aspect of attractiveness is 98%. It can be concluded that the interactive e-module is valid according to the material expert, very valid according to the teaching material expert and user, very practical according to user and student, and very interesting according to the student. This means interactive e-module are very practical and interesting.

**Keywords:** interactive e-module, 3D page flip, self-reinforcing character

## 1. INTRODUCTION

One of the important needs of humans is education. In-Law Number 20 of 2003 concerning the National Education System, it is written that education is a conscious and planned effort to create an atmosphere of learning and the learning process so that students actively develop their potential to have religious-spiritual strength, self-control, personality, intelligence, noble morals, as well as the skills needed by them, society, nation, and state. This means that consciously and planned teachers as an educator must have the responsibility to educate. This can be achieved by the teacher preparing a planned learning process, thereby fostering the enthusiasm of students to increase their potential, both in terms of attitudes, skills, and knowledge. One of the ways to develop this potential is through formal learning. Formal learning is a learning activity that takes place in schools with students and teachers as the main implementers.

Educational processes and goals can be achieved through the learning process. With education, knowledge will expand, skills can be honed, and attitudes that reflect the Pancasila principles will grow and develop. Therefore, the learning process in schools should be

prepared as well as possible and fun so that the development of the potential of students can be achieved maximally. This is following the Regulation of the Minister of Education and Culture (Permendikbud) Number 22 of 2016 concerning Basic and Secondary Education Process Standards that the implementation of the learning process in schools is fun, interactive, motivating, inspirational, and challenges students to actively participate and provide space sufficient for the independence of creativity, and initiatives under physical, psychological, interests and talents of students. This means that a teaching-learning atmosphere is created in such a way that students focus their attention more when the learning process takes place. Learning with an atmosphere like this aims to develop the knowledge and skills of students, so a good character is created.

In general, a character is influenced by the factors of human itself (Fitri, 2012). Character development needs to be cultivated in children since childhood because character development can shape children's characteristics. This is the reason for the importance of character education in elementary schools. Substantively, character education aims to direct and facilitate students to increase their potential. To achieve this goal, students

should also study independently at home. The Ministry of National Education (in Wibowo, 2012: 43) explains that one of the indicators of the success of character education is the emergence of an independent character, namely that individuals can solve problems without easily depending on others. The independent character of students is important to develop because this character has a relationship with academic success. Students are trained to consider options and make their own decisions and are free to do their own needs (Fitri, 2012).

Besides, Mu'in (2011) further states that the individual character in a nation will reflect the character of the nation, in other words, a character is the foundation of a nation. This is what causes character education to be so important to teach students since elementary school. Further states that the individual character that exists in a nation will reflect the character of that nation, in other words, the character is the foundation of a nation. This is what causes character education to be so important to teach students since elementary school. Further states that the individual character that exists in a nation will reflect the character of that nation in other words, the character is the foundation of a nation. This is what causes character education to be so important to teach students since elementary school.

Elementary School Karangtengah 1 Blitar City Indonesia is one of the schools that apply technology in teaching and learning activities. According to the results of observations and interviews of student's grade V Elementary School Karangtengah 1, 29 students with 10 male and 19 female, 24 students (82.8%) like learning involving the use of technology including computers / laptops. Also, 26 students (89.7%) needed additional explanations such as videos, illustrations, or pictures to understand the material. Homeroom teacher, Anna Riana, S.Pd. SD said that grade V students used thematic textbooks Curriculum 2013 without any other textbooks. The material in this book is still general, so teachers must browse and look for additional material. Reviewing the existing conditions, several things need to be done, by adding teaching materials, in a textbook, modules, evaluation/question books, both in the form of hard files or soft files (electronic-based).

Besides, teachers can provide additional material using media, which can be audio, visual, or audiovisual. However, the environment that is concrete and familiar to students is easier to use in the learning process. To overcome this, one solution is to develop an interactive electronic-based module (e-module) according to the needs of students and teachers. The advantage of this interactive e-module is can be accessed offline using a computer/laptop. The material is completer and more detailed. Also, there is an interesting student activity sheet. At the end of each lesson, there is an evaluation question. The e-module is also equipped with animations

both videos and images that can be used by students to study at home independently.

## 2. METHOD

This research method uses the R & D model by Borg and Gall in Sugiyono (2016) which consists of ten steps, are potential and problems, data collection, product design, product validation, product revision, product testing, product revisions, trial use, product revisions, and mass production. The subjects of the interactive e-module development research are 29 student of grade Va Elementary School Karangtengah 1 Blitar, Indonesia. Collecting data through interviews, questionnaires, and observations.

The interview is used to analyze the potential and problems contained in learning. There are 2 questionnaires used, the student response analysis and the validator assessment questionnaire. Observations made for grade Va Elementary School Karangtengah 1. This research uses qualitative and quantitative analysis techniques. The qualitative analysis technique is carried out by analyzing the validation questionnaire of experts, teacher, and students that are developed in a form of criticism, comment, and suggestion.

Meanwhile, a quantitative analysis is used to test validity, practicality, and attractiveness. The results of the validation of material expert, teaching material expert, and user use a Likert scale. While student's questionnaire response data were analyzed using the Guttman scale. Quantitative data analysis techniques use percentage techniques. The results of the calculation of the percentage of validity are interpreted and interpreted as in Table 1.

**Table 1 Criteria for Categorization of Validity**

Achievement Rate (%)	Category	Test Decision
86.00 - 100.00	Very valid	Can be used without revision
71.00 - 85.00	Valid	Can be used, but needs revision
56.00 - 70.00	Valid enough	Can be used with major revisions
41.00 - 55.00	Less valid	Cannot be used and needs revision
25.00 - 40.00	Invalid	Should not be used

Based on Table 1, an interactive e-module can be used if the percentage of validity is above 71%. The results from the percentage calculation of practicality and attractiveness are interpreted in Table 2. The interactive e-module can be used if the percentage of practicality and attractiveness is above 61%. If the percentage level of practicality and attractiveness has not reached 61%, it is necessary to revise it according to the suggestions and input of students (Akbar, 2017).

**Table 2 Practical and Attractiveness Categorization Criteria**

Achievement Rate (%)	Category	Test Decision
81.00 - 100.00	Very practical/very attractive	Can be used without revision
61.00 - 80.00	Practical/attractive	Can be used, but needs revision
41.01 - 60.00	Practical/attractive enough	Can be used with major revisions
21.00 - 40.00	Less practical/less attractive	Cannot be used and needs revision
00.00 - 20.00	Impractical/unattractive	Should not be used

### 3. RESULT

Research and development of an interactive e-module with the self-reinforcing character for elementary school students based on Borg and Gall's R & D (Sugiyono, 2016). The first step is the potential and problems. Based on observations found some potential, there is a computer laboratory at schools and students can operate computer devices. From the interview there is a problem, only use one textbook, Curriculum 2013 thematic book.

This problem caused the teacher difficult to teach and needs to browse some materials. So, it is necessary to research and develop an interactive e-module with the self-reinforcing character for elementary school students. After analyzing potential and problems, the next step is collecting data.

Data collection was carried out based on the results of potential and problem analysis and identification of textbooks used in teaching and learning activities. The data collected are materials for developing products, then analyzing KI and KD in the textbook with KI and KD from Regulation of the Minister of Education and Culture Number 24 of 2016. After that, development continues to designing the product.

Product design is carried out in 2 stages, designing interactive e-module products and assessment instruments. Designing an interactive e-module begins with analyzing KI and KD, formulating indicators and learning objectives, looking for material according to topics, looking for references to develop student's activity and evaluation questions, and designing an interactive e-module using 3D Page flip. Then, design a research instrument for 3 validities (material expert, teaching material expert, and user) and a student response questionnaire.

The finished product design and research instruments were consulted with the supervisor and revised. After the revision is complete, proceed to the product validation step. The product was validated by 3 experts, material expert, teaching materials expert, and grade V teaches as a user. Product validation aims to produce a valid and practical interactive e-module with a self-reinforcing character. The validation data are presented in Table 3.

**Table 3 Data on the Validation Results of Material Experts, Teaching Material Experts, and Users**

No.	Assessment Aspects	Percentage of Assessment (%)		
		Material Expert	Teaching Materials Expert	User
1	Material presentation	85	88.3	-
2	Content eligibility	86.7	100	-
3	Language	81.7	-	-
4	Design presentation	-	88.9	-
5	Self-reinforcing character	86.7	80	100
6	Product contents	-	-	98.3
7	Product design	-	-	100
8	Product usability	-	80	100
9	Practicality	-	-	100
	<i>Total</i>	340.1	437.2	498.3
	<i>Average</i>	84	87	99.3
	<i>Criteria</i>	Valid	Very valid	Very valid and practical

Based on Table 3, the results of the interactive e-module product validation by a material expert is 84% in a valid category. The teaching material expert assesses the validity of the product by 87% with a very valid category. Meanwhile, user gives point 99.3% in a very valid and very practical category. Product validation gets an average rating of 91.9% in a very valid and practical category, so the product is suitable to use in teaching and learning activities.

The fifth step is product revision. Revisions are made by changing and improving the product based on the validation results of the three experts. Material experts advise that social science material contains at least 2 of the 7 components of Social Sciences. Teaching material experts provide suggestions to focus more on the purpose of the foreword. Users provide suggestions to include KI at the beginning of each lesson. After the revision is complete, the product is ready to be tested.

The product trial is carried out on February 24, 2020, with 4 subjects from Vb grade students of Elementary School Karangtengah 1. Product trials were aimed at obtaining data on practicality and attractiveness and minimizing product shortages before the trial use. At the beginning of learning, students are given instructions on how to use an interactive e-module. Students easily understand and use this product. It can be seen from the enthusiasm of students who open e-module pages and operate the interactive buttons. At the end of the lesson, students are given evaluation questions and responses to questionnaires of interactive e-module product.

The next step is a revision based on the student's questionnaires and problems found when testing the product. Revisions are carried out on hyperlink and

evaluation questions. Several sentences need to be replaced due to typo. After the product is revised, it is ready for trial use.

The trial use is conducted on February 27, 2020, with 29 students from Va Elementary School Karangtengah 1. Due to the limited computers and laptops, 2 students took turns using 1 computer. The steps for a trial use are almost the same as for a product trial. The data of product and usage trials are presented in Table 4.

**Table 4 Data Tables of Practicality and Attractiveness in Product and Usage Trials**

No.	Assessment Aspects	Percentage of Assessment (%)	
		Product Trial	Trial Usage
A	Practicality	95.8	98.3
B	Victory	97.2	98.9
	Total	193	197.2
	Average	96.5	98.6
	Criteria	Very Practical and Attractive	Very Practical and Attractive

From the results, the practicality aspect is 97% with a very practical category. Meanwhile, the attractiveness aspect is 98% in a very attractive category. The product gets an average percentage of 97.5% with a very practical and attractive category. Thus, interactive e-module are appropriate for use in studying and learning.

The next step is a revision based on student's questionnaires and problems found when testing usage. Revisions were made to the table of contents, adding to the writing of KI. After the product has been revised, it continues to produce an interactive e-module in a large number. The final step, mass production, is carried out in a limited manner due to limited time and funds. Mass production is done by uploading an interactive e-module product to Google Drive or copying it to a CD/flash disk. CD/flash disk will be given to grade V teachers, so students can request interactive e-module from grade teachers. Here the link to access the product [https://drive.google.com/drive/folders/1LYwphX9AjAmiL5IvZf5lpYvK3L\\_BhKLj?usp=sharing](https://drive.google.com/drive/folders/1LYwphX9AjAmiL5IvZf5lpYvK3L_BhKLj?usp=sharing).

## 4. DISCUSSION

### 4.1 *The Validity of an Interactive E-Module with The Self-Reinforcing Character for Elementary School Students*

The validity of the interactive e-module product is based on the validation results of a material expert, a teaching material expert, and a user. Validation includes 8 aspects, presentation of material, feasibility of content, language, presentation of design, independent character, product content, product design, and product usability. Validation product from the material expert is 84% with a valid category, teaching material expert rated the product at 87% with a very valid category, and user rated the product validity at 99.3% with a very valid category.

So, it can be concluded that an interactive e-module is suitable for use in learning.

Each validator carries out validations on different aspects. Aspects of material presentation and content feasibility are validated by a material expert and a teaching material expert. The validity of the material presented by material expert scored 85% in the valid category and teaching material experts rated 88.3% with a very valid category. This aspect assesses the suitability of the material, the scope of the material, and the material coherence. Meanwhile, the validity of the content feasibility based on the validation of material expert and teaching materials expert is 86.7% and 100%, this means the feasibility of the interactive e-module content is very valid. This aspect assesses the e-module format. From the assessment of these two aspects, the material expert suggested that the social studies material contains at least 2 of the 7 basic components of Social Sciences. Abu Ahmadi (in Endayani, 2017: 4) explained that Social Science is a field of study that combines several disciplines of Social Sciences. These components are used as raw materials for the implementation of social studies content teaching and education programs in elementary school.

The teaching material expert suggests that the material is adapted to the daily life of students. Improvement is made to the material and student activity by focusing on the geographical and cultural conditions. As explained by Bahtiar (2015: 2) that in preparing teaching materials, the needs and characteristics of students must be considered, including cultural, geographical, social, or student development. It is intended that students can master the learning material thoroughly.

Next is the language aspect which is validated by material experts. This aspect assesses the accuracy of writing, the accuracy of sentences, communicative, and readability. In the language aspect, the validity is 81.7%, meaning that the language used is valid. Improvements made to word writing, sentence effectiveness, and word use that were easily understood by students. As in the Let's Write section, which previously took the form of an order, "Give examples of hero attitudes that you should emulate!" to be a sentence, "the attitude of the heroes that I should emulate is". Bahtiar (2015) explains that the sentence structure is by the grammar and vocabulary that is used in general and is easy to understand.

The presentation aspect of the design is validated by teaching material experts. This aspect evaluates readability, communicative, and appearance. The validity of this aspect is 88.9% meaning that the presentation of the interactive e-module design is very valid. For the sake of product perfection, improvements were made to several parts that were deemed inappropriate. In the

preface, the user is changed to learners and teachers. Then, combine the colors and illustration of the back cover with the front cover. According to Muslich (2010) in illustrations, color elements and typography are arranged as harmoniously as possible and are interconnected. The choice of color, type, and size of letters, as well as illustrations on the cover will determine the initial interpretation of the reader. Therefore, carefulness is needed so that the interactive e-module display looks harmonious, integrated, and attracts readers.

Validation is also carried out on the independent character aspect. This aspect assesses the independent character of students. The validity of the aspects of independent character based on the validation of the material experts, instructional materials experts, and users respectively 86.7%, 80%, and 100%. This means that the validation from material experts and users is declared very valid, while the validation from teaching material experts is declared valid. Improvements were made to the interactive e-module instructions section. Each step of the instructions is added with a screenshot image to make it clearer. It is in line with Brown's opinion (Sudjana & Rivai, 2013) that clear instructions and the presence of pictures in one full or half-page are preferred by children. Instructions for use are given at a glance at the start of the interactive e-module product.

Next, validate aspects of product content and product design by users. The validity of the product content aspect is 98.3% and the product design is 100%, meaning that the validation of these two aspects is very valid. Validation of product content aspects assesses the suitability of the material, the scope of the material, the scope of the material, and the coagulation of the material. The product design validation assesses the e-module's format, readability, and appearance. Users suggest that the interactive e-module includes core competencies at the beginning of the lesson, especially for lessons that contain PPKn content. The addition of IP is intended so that readers can estimate the results obtained when learning an interactive e-module. Then, the placement of multimedia (audio, images, and video) is adjusted to the color, type, and font size elements. For example, a box for writing let's observe, let's write, and others are blue according to the background which is also blue. Thus, the integration of components in an interactive e-module supports the readability of content when used by readers.

The validation of the product usability aspects is carried out by teaching material experts and users. This aspect assesses the learning and usefulness of the product. The validity of this aspect is based on the validation of teaching materials experts and users of 80% and 100%, respectively. This means that validation by instructional materials experts on aspects of the use of valid interactive e-module products can be used with revisions. Meanwhile, validation by users on the usability

aspect of interactive e-module products is very valid, so it can be used without revision.

Improvements were made to the problem-solving section (let's reason) because some words are difficult to understand. Improvements are adjusted to the cognitive abilities of students in grade V. For example, in the sentence, "you wear batik typical of Blitar city, Beni wears batik with Cenderawasih bird, Mira wears batik with a Kenanga flower". Problem-solving questions emphasize more on reasoning activities and character development. Character development is very important to do because a character is related to academic success. Fitri (2012) explains that students are trained to consider options and make their own decisions. Therefore, the interactive e-module product is equipped with problem-solving questions.

#### ***4.2 Practicality and Attractiveness of an Interactive E-Module with The Self-Reinforcing Character for Elementary School Students***

The practicality of the interactive e-module product is based on the r user validation and student response questionnaires, while the attractiveness of the product is assessed from the student response questionnaires. In terms of practicality, user gives validation point 100% with a very practical category, so it can be used without revision. Based on the student response questionnaires, in terms of practicality, it was obtained a 97% with very practical category and can be used without revision. Meanwhile, from the aspect of attractiveness, it was obtained a 98% in the very attractive category and can be used without revision.

On practicality, user assesses the effectiveness and efficiency of the interactive e-module product. The validity of this aspect is 100%, the interactive e-module with self-reinforcing character is very practical, so it can be used without revision. The effectiveness of the interactive e-module can be seen from the material that is explained in detail, multimedia that helps explain the material, and evaluations that match the material. The efficiency of an interactive e-module can be seen from the ease of students in accessing and using interactive e-module.

There are 2 aspects assessed from students' questionnaire responses are practicality and attractiveness. In the practical aspect, there are 2 points of assessment, effectiveness and efficiency. Effectiveness got a score 100% in both trials. This means the effectiveness of an interactive e-module is very practical and can be used without revision. Then, the efficiency aspect got a score 91.6% in a product trial and 96.5% in a usage trial, respectively. This means an interactive e-module is very practical and can be used without revision. The average evaluation of the

effectiveness and efficiency of interactive e-module products was 100% and 94%, respectively. Based on the results of these trials, it can be concluded that the interactive e-module with independent character strengthening is very practical and can be used without revision.

In the aspect of attractiveness, there are 2 points of assessment, namely interactive and interesting. In the product and usage trial, the scores are 97.4% and 100%, severally. This means an interactive e-module is very interesting and can be used without revision. Then attractive aspect, the attractiveness levels in product trials and usage trials were 100% and 97.9%, each. This means an interactive e-module is very interesting and can be used without revision. The average interactive and interesting assessment of the interactive e-module product is 98.7% and 98.9%, each. Based on these trials, it can be concluded that the interactive e-module with independent character reinforcement is very interesting and can be used without revision (Rini & Cholifah, 2020).

At the product trial stage, a small improvement made to the words 'Klik Aku', the font is enlarged and made bold. After the repair is complete, then a usage trial is carried out. Based on the product and usage trials there are several findings, including students are enthusiastic about learning, easy to understand the material, can operate interactive e-module, and develop independent characters.

The development of an interactive e-module can increase thinking activeness and develop the independent character of students. Reasoning activities can train students to actively think and develop their answers. Student's activeness is usually accompanied by an independent attitude and competition (Putra et.al, 2016). As expressed by Piaget (in Sumantri & Syaodih, 2009) that one aspect of students' basic needs is self-actualization. Where children in the fifth grade of elementary school begin to desire to realize their potential and dreams. Thus, competition arises between children who want to fulfill their needs. With the interactive e-module, students can increase their potential and talents optimally. Besides, at the end of each lesson, some evaluations are equipped with the acquisition of scores and answer signs that can help students in learning.

### ***4.3 Strengths and Weaknesses of An Interactive E-Module with The Self-Reinforcing Character for Elementary School Students***

Research and development of an interactive e-module with the self-reinforcing character for elementary school students which is valid, practical, and interesting, so it is suitable for use in teaching and learning activities. The interactive e-module is equipped with a user manual

starting from how to install, operate, and share the product with others. In addition to the manual, an interactive e-module also provides instructions for use at a glance so that teachers and students can easily use the product. At the beginning of each lesson, KI, KD, indicators, and learning objectives are listed for each content so that teachers and students can find out the material to be studied and estimate the results to be obtained.

Based on a study of interactive e-module products with strengthening independent character, there are several advantages and disadvantages. The advantages of this product are in the form of attractive design, short and clear material, interactive LKPD which trains students to think critically, such as in the activities "let's practice" and "let's reason". These activities are also to help develop the independent character of students. Then, interactive multimedia containing additional explanations make it easier for students to understand the material, as well as audio that can accompany students in learning. The drawback of this product is that it is a multimedia product and can only be applied to PCs, such as computers and laptops. Thus, users are required to be able to operate the product on the computer. However, this can be overcome by reading the user manual that has been provided. The user manual contains instructions for using the interactive e-module starting from how to install, operate, and share the product with others. In addition, each step is equipped with a picture, making it easy to understand.

## **5. CONCLUSION**

Based on material expert validation, the percentage is 84% valid. Teaching material expert assesses the validity of teaching material by 87% with a very valid category. User rated the product validity at 99.3% with a very valid category. While in terms of practicality, users give 100% value in the very practical category. The results of questionnaire responses from students in product trials and usage trials showed practicality with an average result of 97% and attractiveness with an average result of 98%.

This means the interactive e-module is very practical and interesting. This research and development produce an interactive e-module with the self-reinforcing character for elementary school students which is valid according to material expert, very valid according to teaching material expert and user, very practical according to user and students, and very interesting according to students. So, this product is suitable to use in learning.

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